RAMA UNIVERSITY

www.ramauniversity.ac.in

FACULTY OF EGINEERING

ARTIFICIAL INTELLIGENCE
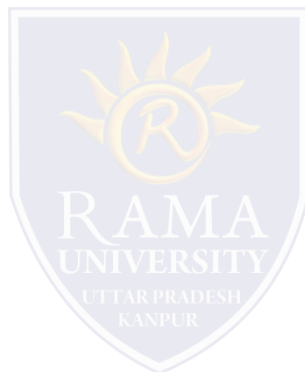LECTURE-04

Mr. Dhirendra

Assistant Professor
Computer Science & Engineering

OUTLINE

❖**Types of AI Agents**

❖**Simple Reflex agent**

❖**Model-based reflex agent**

❖**Goal-based agents**

❖**MCQ**

❖**References**

Types of AI Agents

Agents can be grouped into five classes based on their degree of perceived intelligence and capability. All these agents can improve their performance and generate better action over the time. These are given below:

- Simple Reflex Agent
- Model-based reflex agent
- Goal-based agents
- Utility-based agent
- Learning agent
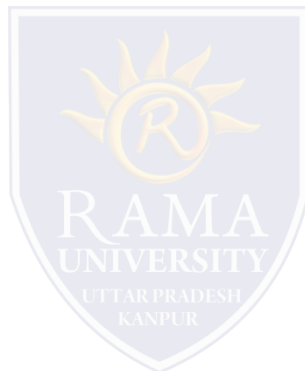
Simple Reflex agent

▪The Simple reflex agents are the simplest agents. These agents take decisions on the basis of the current percepts and ignore the rest of the percept history.

▪These agents only succeed in the fully observable environment.

▪The Simple reflex agent does not consider any part of percepts history during their decision and action process.

▪The Simple reflex agent works on Condition-action rule, which means it maps the current state to action. Such as a Room Cleaner agent, it works only if there is dirt in the room.

▪Problems for the simple reflex agent design approach:

❑They have very limited intelligence

❑They do not have knowledge of non-perceptual parts of the current state

❑Mostly too big to generate and to store.

❑Not adaptive to changes in the environment.
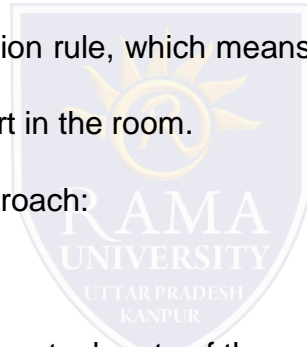
Simple Reflex agent
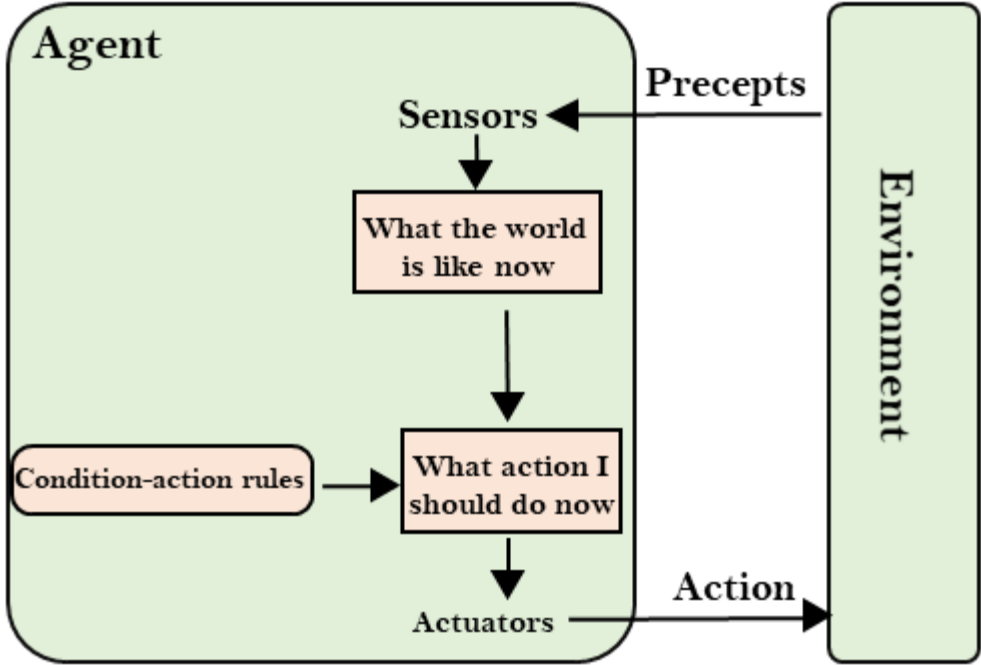
Model-based reflex agent

The Model-based agent can work in a partially observable environment, and track the situation.

A model-based agent has two important factors:

Model: It is knowledge about "how things happen in the world," so it is called a Model-based agent.
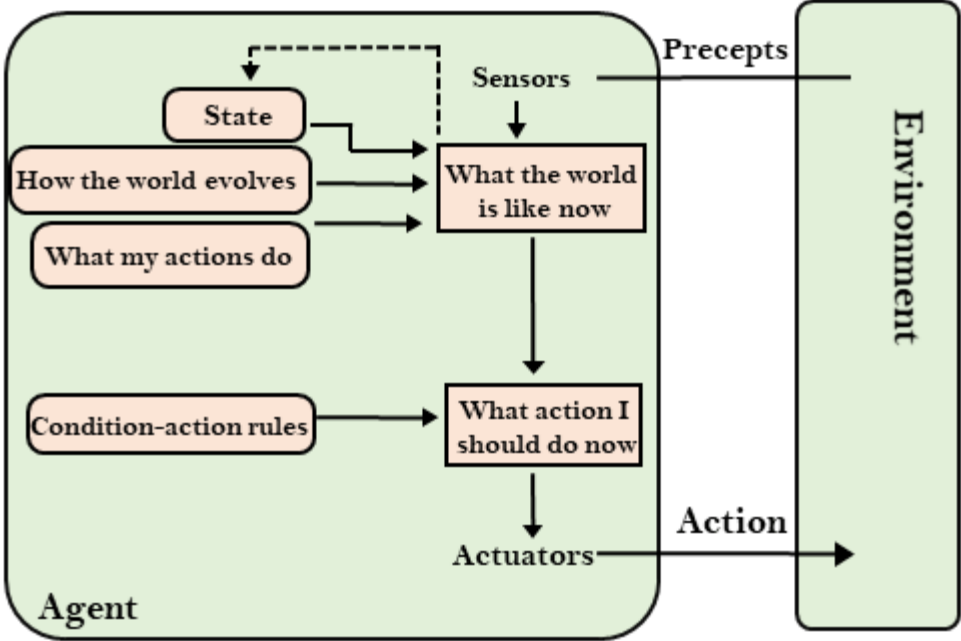
Internal State: It is a representation of the current state based on percept history.

These agents have the model, "which is knowledge of the world" and based on the model they perform actions.

Updating the agent state requires information about:

How the world evolves

How the agent's action affects the world.

Model-based reflex agent

Goal-based agents

- The knowledge of the current state environment is not always sufficient to decide for an agent to what to do.

- The agent needs to know its goal which describes desirable situations.

- Goal-based agents expand the capabilities of the model-based agent by having the "goal" information.

- They choose an action, so that they can achieve the goal.

- These agents may have to consider a long sequence of possible actions before deciding whether the goal is achieved or not. Such considerations of different scenario are called searching and planning, which makes an agent proactive.
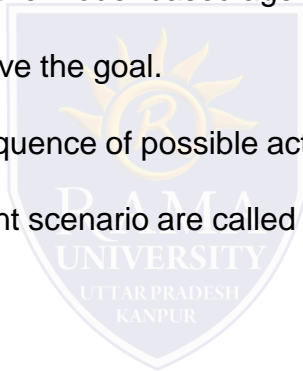
Goal-based agents
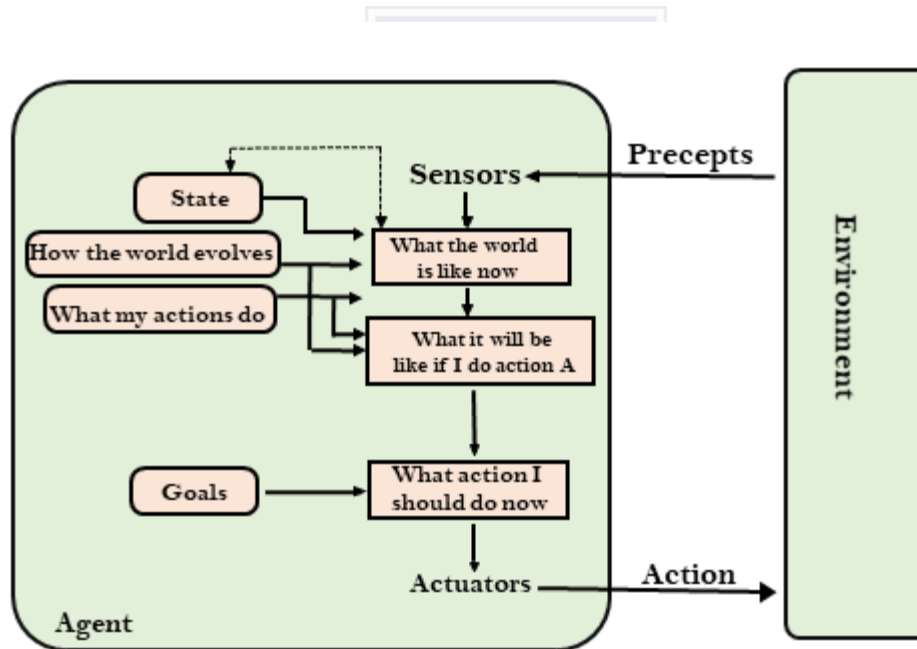
1. A.M. turing developed a technique for determining whether a computer could or could not demonstrate the artificial Intelligence, Presently, this technique is called _____

a) Turing Test

b) Algorithm

c) Boolean Algebra

d) Logarithm

2. A Personal Consultant knowledge base contain information in the form of _____

a) parameters

b) contexts

c) production rules

d) all of the mentioned
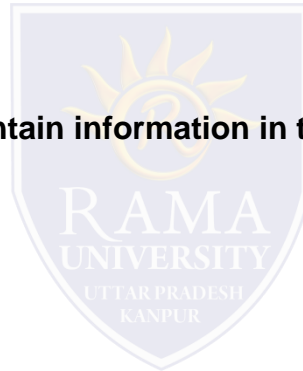
3. Which approach to speech recognition avoids the problem caused by the variation in speech patterns among different speakers?

a) Continuous speech recognition

b) Isolated word recognition

c) Connected word recognition

d) Speaker-dependent recognition

4. Which of the following, is a component of an expert system?

a) inference engine

b) knowledge base

c) user interface

d) all of the mentioned

5. A computer vision technique that relies on image templates is _____

a) edge detection

b) binocular vision

c) model-based vision

d) robot vision

References

- https://www.javatpoint.com/digital-image-processing-tutorial

- https://www.tutorialpoint.com/

- Stuart Russell, Peter Norvig, "Artificial Intelligence - A Modern Approach", Pearson Education.

- Elaine Rich and Kevin Knight, "Artificial Intelligence", McGraw-Hill.

- E Charniak and D McDermott, "Introduction to Artificial Intelligence", Pearson Education.

- Dan W. Patterson, "Artificial Intelligence and Expert Systems", Prentice Hall of India.